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Italy

FDD Abstract

Optics and Electronics in Italy; 19 pages; no date indicated on documents; pages 1 through 16 - French, pages 17 through 19 - German.

Detailed descriptions, with illustrations, of an infrared lead-sulfide cell and various types of equipment incorporating same.

I. INFRARED LEAD-SULFIDE CELL. This cell is an essential element in all infrared equipment whose sensitivity range must extend to a wavelength of approx. 3.5 $\mu$ , such as (1) rocket control devices, (2) proximity fuses for AA projectiles and rockets, (3) signalling devices for the detection of infrared rays emitted by the enemy, (4) infrared mine ~~detectors~~ detonators, (5) coarse rasters (image disectors) increasing visibility in fog, and for blind landings, and (6) command equipment for canoes with explosive charges, and for other applications.

II. INFRARED PROXIMITY FUSES FOR PROJECTILES AND ROCKETS. The rays emitted by a warm target are utilized, in conjunction with a receiver and amplifier, to set off the fuse. This is suitable for calibers from 80 mm up. Detonation distance is variable between zero and twenty-five meters.

III. INFRARED HOMING DEVICES FOR ROCKETS DIRECTED BY STEERING MECHANISM. The heat radiation of a target is used, in conjunction with receiver and amplifier, to control the steering mechanism of rockets. The homing device supplied exact commands to the steering mechanism (height, angle, etc) conforming to the distance separating the target from the axis of the projectile. Suitable for calibers of 150 mm and up.

IV. INFRARED SIGNALLING DEVICE. Infrared rays emitted by a warm target are applied to a lead-sulfide cell through an optical system. After amplification, indication is obtained on an instrument. The device is suitable as radio DF equipment to locate objects emitting infrared rays (searchlights, armored cars, motor vehicles, aircraft, etc).

V. INFRARED IMAGE CONVERTER FOR NIGHT OBSERVATION AND DF OPERATIONS, AND FOR THE STUDY OF MATERIALS. The image converter serves to reproduce objects irradiated with infrared rays and objects emitting such rays. It is also suited for the technical study of materials.

VI. COARSE-RASTER INFRARED IMAGE CONVERTER -- BLIND-LANDING DEVICE. By means of a suitable optical system the image ~~in~~ of an object emitting infrared rays is dissected into a coarse raster. The brightness values of the image points are transformed into electrical values by means of a special lead-sulfide cell. Following amplification, a visible image is produced on a cathode-ray indicator tube. It detects infrared radiating targets of 1 kw output at a distance of 3 kilometers. It operates - in contrast to snooperscope, etc - on the passive method, i.e., it cannot be detected by the object under observation since it includes no ray-emitting source of its own. With proper modifications, the device may be used (1) as aircraft blind-landing device (using standard or infrared-filter markers), (2) as blind-navigation equipment for ocean vessels (using standards or infrared-filter beacons), (3) as night-flying equipment for fighter aircraft, (4) as a night-vision and aiming device, as shown under (3), against such other heat-emitting targets as aircraft, ships, armored cars, etc. coupled with other weapons including anti-aircraft weapons, artillery, antitank, automatic weapons, etc).

ABSTRACTOR: [REDACTED]

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Date: April 17, 1952

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